Editorial

Biman Nath, Associate Editor

Email:biman@rri.res.in

Galileo discovered four hundred years ago that the Sun was not an object without blemish, as all celestial objects were thought to be in the ancient Greek philosophy. With his newly built telescope, he peered at the Sun (damaging his eyes in the process) and saw dark spots scattered over the disk of the Sun. He argued later on the basis of his observations that celestial objects were not made of anything extraordinary and they could be subjected to the laws of natural philosophy. Galileo's discoveries changed the way mankind thought about Nature, and the fourth centenary of this historical epoch is being celebrated this year as the International Year of Astronomy.

Sunspots remained a mystery for centuries after Galileo's discovery. It was not clear if these regions contained gas that was hotter or cooler than in the surrounding areas. Does gas in sunspots come out of or go down into the interior of the Sun? What causes them in the first place?

Exactly three hundred years after Galileo's discovery, a British astronomer working in India obtained the first definitive data for the motion of gas in and around sunspots. In 1909, John Evershed at the Kodaikanal Observatory (the predecessor of today's Indian Institute of Astrophysics at Bangalore) found out exactly how the gas in sunspots moved. This 'Evershed effect' was one of the major discoveries that helped astronomers unlock the mysteries of sunspots, and this year marks its centenary.

This issue of *Resonance* carries two articles on the life and works of John Evershed, including one about the physics behind the Evershed effect. During his tenure, the Kodaikanal observatory became one of the few places in the world (besides the observatories at Mount Wilson, USA, and Meudon, Paris) that contributed to the laying of foundations for solar physics. What makes the Evershed effect exciting even after its discovery a hundred years ago is that the actual reason for the motion of gas in sunspots is not yet clearly understood, because the interplay between magnetic and other forces on hot matter is still a topic of research.

In addition, continuing with our Darwininan theme for this year, there is an article on the unit of natural selection that not only raises interesting questions regarding biology but also about the philosophy of science.